

US EPA ARCHIVE DOCUMENT

APPENDIX 7.5

SELECTIVE ABSORPTION TECHNOLOGIES

7.5.1 SAMMS

This technology is based on the attachment of a sulfur ligand to a ceramic bead for immobilization. This technology was developed for the treatment of radioactive nuclear waste. The ceramic beads used in this process are in the 1 to 5 micron size and would be very difficult to work with on an industrial scale. They have been working on method of imbedding the particles into membranes to make them more usable. This technology has not gotten beyond the laboratory testing stage and the material is still being manufactured in gram size batches.

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Commercial Contact: Nick Lombardo
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7.5.2 Thio Crown Ether

Thio crown ethers have been manufactured and used to remove mercury from aqueous solutions even at very low pH. This technology was developed for the removal of mercury from acid solutions. The developer has not yet attached the thio crown ether group to a polymer to immobilize it. So far it has been used as a flocculent followed by filtration. Testing in muriatic acid was found to be ineffective and 50% sodium hydroxide was not tested because the developer felt that the ether would not survive the test.

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7.5.3 MYCELX

This material is a reaction product between a natural drying oil and a synthetic polymer that seems to be very good at removing trace organic impurities from wastewater. An article published in Environmental Protection during December of 1998 claimed fantastic mercury reductions. It was a misprint!!

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7.5.4 Molecular Recognition Technology

MRT uses specially designed ligands or macrocycles chemically bonded to solid supports to selectively remove mercury from wastewater systems. This technology is very similar to thio crown ether technology developed by John Reynolds at Lawrence Livermore except that this is a private company and seems to be further down the development path than Lawrence. This is another technology that may be worth looking at in the future. At this time only one commercial installation exists (in a sulfuric acid plant) and looks to be very expensive and very difficult to regenerate. The developer was proposing a single use ligand with replacement.

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7.5.5 Mercur-RE

This technology is based on a noble metal sorbent coated on a solid support which is then thermally regenerated to recover the mercury in the liquid elemental form and reuse the sorbent. This technology claims to absorb mercury regardless of form and has been applied through the use of test skids to wastewater and flux applications. This technology has not been commercially applied to date. The developer does not recommend its use in 50 % sodium hydroxide.

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